REMARKS

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, claims 1 and 2 have been amended to correct typographical errors therein.

Applicants believe that the above changes answer the Examiner's objections to claims 1-3, and respectfully request withdrawal thereof.

The Examiner has finally rejected claims 1-4 and 6 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,278,792 to Cox et al.

The Cox et al. patent discloses a robust digital watermarking in which a watermark to be embedded in a picture is a vector W[k], k=1..N. The watermark is embedded in the DCT domain. To this end, an equally long vector V[k] is extracted from the picture. More particularly, the DCT coefficients of the picture are classified into N sets. A weighted sum of the coefficients of set 1 constitutes V[1], a weighted sum of the coefficients of set 2 constitutes V[2], etc. The picture is modified such that its vector V[k], k=1..N, has a high correlation with W[k].

Watermark detection is shown in Fig. 8 and described in Cox et al. at col. 12, line 12, to col. 13, line 8. The detector receives an MPEG stream. The stream is Huffman decoded (80) so that the DCT coefficients are available. The coefficients are classified

as described above and summed in an accumulator (82) to obtain a vector having length N. This vector is then correlated (84) with the watermark W[k] to be detected. In the event that the input signal is uncompressed video data, Cox et al., in Fig. 9 and at col. 13, lines 9-32, indicates that that the uncompressed video data is first accumulated in 8x8 accumulators 90, and subjected to DCT transform in DCT transformer 92 thereby forming nxn DCT's (i.e., discrete cosine transform coefficients). The watermark is then detected in these DCT's according to that shown in Fig. 8, i.e., accumulating the DCT's in watermark accumulators 94, and comparing the output of watermark accumulators 94 with possible watermarks in comparator 96.

As noted in Cox et al. at col. 13, lines 33-38, "A limitation of block based DCT methods is their sensitivity to spatial shifts of the image. For example, if the image is shifted two pixels to the right, then the DCT coefficients change significantly, so that the watermark cannot be detected. Furthermore, general distortions, such as scaling and rotation, also make the watermark undetectable." Cox et al., at col. 13, line 39 to col. 17, line 40, then describes processes for compensating for the offset of the nxn grid, and further states "These processes are performed in the registration process 108 as will be explained later." Then, Cox et al. states that the output from the registration process is accumulated and converted into the DCT

domain, and the watermark is extracted using accumulators 114, watermark extractor 116 and watermark decoder 118 (Fig. 10, col. 17, line 51 to col. 18, line 23).

The Examiner now quotes from Cox et al., col. 17, line 51, to col. 18, line 12, and then states "From the above passage, it is noted that the process of finding the offset value of the 8x8 grid and compensating for the offset using 8x8 accumulators 106 and the registration process 108 is pad [sic] of the process of detecting the watermark." The Examiner further adds "Since finding the offset value of the 8x8 grid and compensating for the offset is part of the process of detecting watermark and is in spatial domain, the claimed "detecting the watermark in said accumulated plurality of pictures" is anticipated by steps 106 to 118 of Cox et al."

Applicants submit that the Examiner is mistaken. What Cox et al. is disclosing is two separate processes, i.e., one for finding the offset value, and the other for detecting the watermark. While these two processes are being performed in tandem, they are nonetheless two separate processes. Cox et al. clearly indicates that watermark detection is to be performed in the DCT (transform) domain: "If MPEG video is the input image data format, the following detection process determines whether watermark W is present, where W[1,...,N] =the watermark being tested for. Decode the Huffman code, **but do not computer the inverse DCT's**, so that, for each frame (at least, each I-frame), there is an array of 8x8

DCTs. Next perform the same summation of DCT coefficients that was performed during watermark insertion to obtain the vector V. Compute the correlation coefficient C, between V and the watermark being tested for, W...." (emphasis added) (col. 11, lines 51 et seq.).

Again, Applicants stress that the watermark detection process of Cox et al. is shown in Fig. 8 and described at col. 12, lines 12-34. It should be further noted that, at col. 12, lines 35-43, Cox et al. notes that when the input data is an uncompressed image, the DCT coefficients are obtained by first performing 8x8 DCT for the whole image. Then the watermark detection process of Fig. 8 may be performed. What is being shown in Fig. 10 is the concatenation of two processes, first the offset compensation process and then the watermark detection process, and that the watermark detection process is in accordance with Fig. 8, i.e., in the transform (DCT) domain.

The Examiner then states "Additionally, even if, arguendo, that finding the offset value of the 8x8 grid and compensating for the offset of Cox et al is not part of watermark detecting process, the claimed "inverse transforming said accumulated coefficients into an accumulated plurality of pictures" is anticipated by the DCT converter 112 of Fig. 10 of Cox et al because the DCT converter 112 of Cox et al is inverse transforming of the Inverse DCT Converter 104 and the claimed detecting the watermark in said

accumulated plurality of pictures is anticipated by Watermark Extractor 116 of fig. 10 of Cox et al. because the alleged "watermark detection is performed in the spatial domain" is not recited in the claims."

It should be apparent from the above that the Examiner does not understand the difference between DCT domain, which includes compressed video in the form of DCT coefficients, and spatial domain, which includes uncompressed video in the form of a plurality of pictures. As clearly indicated by Cox et al., DCT converter 112 converts the accumulated registration data into the DCT domain (col. 18, lines 5-9).

Applicants submit that it would be redundant for the phrase "watermark detection is performed in the spatial domain" to be included in the claims. In particular, claim 1 recites "A method of detecting a watermark in a compressed video signal comprising spectral coefficients obtained by transforming pictures of said video signal". This means that the signal being processed is already in the transform (DCT) domain, i.e., it comprises coefficients as opposed to pictures. Claim 1 further recites "accumulating spatially corresponding coefficients of a plurality of pictures". This means that the coefficients in the transform domain are being accumulated. Next, claim 1 recites "inverse transforming said accumulated coefficients into an

accumulated plurality of pictures". This means that the transform signal of the accumulated coefficients is changed to the spatial domain of pictures. Claim 1 finally states "detecting the watermark in said accumulated plurality of pictures". This means that watermark detection is being performed in the spatial domain. It should be noted that Cox et al. acknowledges that MPEG video (comprising coefficients) is in the DCT domain (see the designation of block 102 in Fig. 10 "8x8 ACCUMULATORS (DCT DOMAIN)"), inverse DCT conversion results in the spatial domain (see the designation of blocks 106 and 110 "8X8 ACCUMULATORS (SPATIAL DOMAIN)", and DCT conversion results in the DCT domain (see the designation of block 114 "8x8 ACCUMULATORS (DCT DOMAIN)".

In view of the above, Applicants believe that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, and as such, is patentable thereover.

Applicants believe that this application, containing claims 1-4 and 6, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by
Edward W. Goodman, Reg. 28,613
Attorney
Tel.: 914-333-9611